

8/22/02

Jerry -

Here's the expected heat rate changes from the HP turbine upgrade & load increases. Based on measured HP efficiencies from U2 acceptance tests.

U1 - Capacity increase: 875 MW → 950 MW
HP eff. increase: 85.3% → 91.5%
Heat Rate change -1.40%

U2 - Capacity increase 900 MW → 950 MW
HP eff. increase 88.4% → 91.5%
Heat Rate change -0.68%

See calc sheet attached

DS.

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- Effect of HP Turb upgrade & increased capacity

For U1

Current capacity 875
 Current HP eff. 85.3%
 Expected capacity 950
 Expected HP eff 91.5% - { based on U2 acc.
 } test @ 950 MW {
 } throttled ~ 2550 psig

- Δ HR % per % HP η change:

- .193% HR change / % η_{HP} change
(based on U2 acc. test data #7)

- % HP η change

$$\frac{91.5 - 85.3}{85.3} \times 100 = 7.27\% \text{ chg}$$

- % HR change U1 875 \rightarrow 950, HP η 85.3 \rightarrow 91.5

$$7.27\% \text{ HP chg} \times \frac{.193\% \text{ HR cha.}}{\% \text{ HP chg.}} = -1.40\%$$

i.e. heat rate will decrease 1.40%

U2

900 \rightarrow 950 Load change

88.4% \rightarrow 91.5% η_{HP} chg

(88.4% is the current HP η @ 900 MW)

$$\% \text{ HP chg} \quad \frac{91.5 - 88.4}{88.4} \times 100 = 3.5\% \text{ chg.}$$

$$0\% \text{ HR chg} \quad 3.5\% \times \frac{.193\% \text{ HR}}{\% \text{ HP}} = -0.68\%$$

Heat rate will decrease 0.68%